

STEPHENSON (F.B.)

Reparative Surgery



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REPARATIVE SURGERY.*

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The following cases came under the professional care and observation of the writer.

Case I. February 12, 1883, a man aged about fifty-six years, received a wound from an iron door as it was closing. The end of the right index finger was so injured that the only connection between the soft parts of the distal phalanx and the rest of the finger was a piece of skin, about quarter of an inch wide, on the palmar surface of the joint. The nail was almost entirely removed from its matrix by the blow, but the bone did not appear to be seriously injured. The parts were at once carefully and securely fastened in natural position, and properly dressed. All went on well. February 16th, the nail was removed; parts somewhat numb. February 19th, general improvement. February 23d, doing well, but with some suppuration; parts firmly attached. March 2d, finger had recovered almost its natural form, and sensation was much increased. From this time there was marked improvement until March 12th, when the patient was lost sight of.

Case II. May 14, 1883, a laborer cut nearly off the third finger of the left hand, near the joint between the second and third phalanges. Carbolized dressing was used, a splint applied, and the hand placed on a pillow. For nine days the parts were irrigated to keep down inflammation. May 28th, doing well; dressed with vaseline and ordinary bandage. June 7th, patient continued improving. September 5th, bony union had taken place; sensation was normal, and the finger well, though straight and stiff. The man had been at his usual work for several days.

We are aware that when parts are not entirely dismembered their complete restoration is now-a-days usually expected; and that the cases here briefly related may appear trivial. The management and study of such cases, however, no doubt common enough in practice, served to bring

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up the general subject of reparative or conservative surgery, and led to the following paper, in which is more especially considered the evidence of a possibility of vital reunion of parts, of any considerable size, that have been wholly detached from the body. The collateral subject of the transplantation of portions to replace parts that have been destroyed or removed, and the matter of skin-grafting, so-called, or the application to open surfaces of very minute particles of skin, and the action of such thereon (which may admit of different explanations), will be alluded to only inferentially.

This subject may not be without important practical bearings also. In these days of machinery and complicated instruments, we often hear of excisions of fingers, toes and other projecting portions of the body. In consequence of wrong ideas of a surgeon's duty, or want of knowledge of the limits of the reparative art, disappointments, ill-feelings, recriminations and lawsuits¹ not infrequently follow, to the great detriment of all concerned. It is therefore worth while occasionally to consider anew such small matters as these, a neglect of which may be fraught with such disproportionate evil results.

As a specimen of the sensational stories gravely related in non-professional periodicals as facts (so-called), and therefore the more misleading and injurious, we take the subjoined account from a paper of very wide circulation and influence.² It is said to have been communicated to the paper by a correspondent of more than ordinary intelligence, even in such matters.

"The following remarkable case occurred about three years ago in North Carolina. A white, delicate girl had her hand completely severed from the arm by an axe. The physician not being in a condition to amputate the arm above the wrist, replaced the hand, securing it with silver stitches and adhesive plaster, and having bound both hand and arm to a broad splint, ordered them to be kept warm with hot flannel cloth. The third day pulsation could be plainly felt in the hand, which had also changed its color. Says the physician in charge,—'I removed the sutures on the fourteenth day, and afterwards she carried the hand in a sling, and is now—three months after the accident—able to extend the fingers and grasp with nearly the usual strength. The joint retained its free motion.'"

A physician once told the writer that a gentleman of presumed good

¹ A professional friend, not long ago, treated one of these cases with great skill and care. The result, though unusually good, was not satisfactory to the uninformed and ill-advised patient, who soon after brought suit for mal-practice against his physician. Although the case was thrown out of court by the judge as unwarrantable, the mere preparations for defense cost the medical man several hundred dollars.

² *The Youths' Companion*, Boston, May 3, 1883.

intelligence related to him, in all seriousness, a case that the narrator knew of, where the eye had been removed from its socket, thoroughly cleansed, and then returned to its normal position, with decided improvement of vision. The one who told this evidently not only believed such things possible, but quite common in surgical practice.

The above are examples only of exaggerated or mistaken narrations, which are of too frequent occurrence. People often, in the most solemn manner, tell of cases where parts have been "entirely cut off, and hung by the skin only," and sometimes professional gentlemen talk in the same loose way. The author has never seen, and practitioners of long and ample experience have declared that they have never seen reunion of parts of any size which have been completely severed, entirely cut apart—no connecting slip of flesh or vessel intervening. Indeed one of the oldest avers that he has never had such happen in his own experience, even where he has given unremitting attention, and where everything appeared most favorable to success, if such were possible; moreover, that he had diligently sought out cases of reputed reunion and found a mistake either in the reported completeness of the division of parts or in the result, generally the former. In some instances before the physician's arrival the parts had been replaced by friends who asserted, and were willing to take oath, that such had been "entirely cut off," even in face of a slip of skin or flesh still existing. The error is often in the phrase "entirely cut off," its popular meaning not being so strictly true as it should be.

While writing this paper, several notable instances have been related to the author, either by patients themselves or their medical attendants; but on investigation they have proved, with one exception, perhaps, to be cases of incomplete separation of parts. Reunion in such cases is generally the rule, not the exception, and therefore they are not objects of special consideration with us at the present time. When parts are attached by a piece of skin, be it ever so small, reunion is probable. The case referred to as exceptional, was told by an aged surgeon, who "remembered" that the middle of the distal phalanx of the thumb was cut through, dividing the bone. The cut-off piece, he said, was brought in the other hand. Two weeks afterwards the part was doing well. "Long afterward," continued the narrator, "the man showed me his hand. It was in good condition, union being quite satisfactory." Though there is not the slightest reason to doubt the truthfulness of this surgeon, there is still a possibility of error in the narration. Often in the hurry and confusion attending accidents, many circumstances are overlooked, misconstrued, or fail to be exactly "remembered." We have heard of a case of incomplete separation attended by another surgeon in which the patient subse-

quently maintained that the finger was clean cut off and held in the other hand; the fact being that, though attached by quite a strip of skin, it had at first fallen over, then was replaced, and thus held until the physician arrived. Patients are apt to overstate their cases to make suitable impressions. Would that practitioners had no such tendency!

A few years ago a case was reported by a surgeon, in one of our medical journals, of the complete removal of a considerable portion of a finger, one phalanx or more, followed by perfect reunion. The dismembered portion, it is stated, was picked up near where the accident happened and replaced more than an hour afterwards. There is internal and other evidence that the wound was not exactly described, and we have seen a photograph of the parts after recovery, which shows a cicatrix of not over four-fifths of the circumference of the finger.

We will now give a case where there hardly seems to be possibility of mistake. It is reported by William Balfour, M.D., of Edinburgh,³ nearly seventy years ago. An adult had one-half of the index cut off by a hatchet, the severed part being an inch on one side, and an inch and a half on the other. When the man came to the surgeon he did not have the piece, which, when brought, was found "white and cold." "It looked and felt like a bit of candle." "Upwards of twenty minutes must have elapsed before the parts were replaced." The dressings were prematurely removed by another practitioner, because the man believed he was carrying about a piece of dead flesh. In spite of this inconsiderate interference, "adhesion had taken place." The accident occurred June 10th, and on July 4th reunion of the parts was complete and the finger had recovered heat and sensation. It was thought necessary to have this case vouched for by the sworn affidavits of the patient and others.

In the first seven editions of his Surgeon's *Vade-Mecum*, Druitt had cited this case as confirmation to his directions for the treatment of "complete disunion." In the eighth edition he omits reference to it, quoting another case. For this he does not give any reason except, perhaps, the general one in the preface that, in this edition, he has "endeavored throughout to replace old and doubtful by new and more certain materials." His new reference is to Bailey, an abstract of whose case we will now recite.

The patient was a man of whom Mr. Bailey⁴ says, "the first phalanx was completely cut through at the middle of the bone, and had been completely separated nearly an hour and a half before I saw it." The

³ *Edinburgh Med. and Surg. Journal*, Oct., 1814, Vol. X., p. 426 and seq.

⁴ *Edinburgh Med. and Surg. Journal*, July, 1815, Vol. XI., p. 317. *

parts were cleansed and put in place. "Reunion was completely effected in about five weeks." The bone was completely united, but the man was not able to bend the finger with the others. This case is not vouched for—but is cited by Druitt. Observe the obscurity in the phrase "cut through at the middle of the bone." It does not follow, therefore, that the end of the finger was wholly detached. Besides, "completely separated" may mean only that the wounded ends had not been placed in contact.

The following is related as an instance of neglect to attempt reunion:⁵

A "blacksmith struck off three of his fingers from about the middle. He ran immediately, with the pieces hanging by small slips of skin, to the surgeon of the village, who cut with his scissors, divided the slips of skin, threw the fingers away, and contented himself with dressing the stumps." The fingers, being still attached, might have reunited had opportunity been given. "Now this gentleman," says the reporter, "did what almost every other surgeon would have done"; that is, he cut off the dangling fragments. This was in 1814.

In the report of this case is an instance of the loose professional use of words we previously commented on—the statement that the fingers were "struck off," while they were still hanging by the skin.

The *Edinburgh Monthly*⁶ has the following, related by Alexander Graham. "A joiner, of middle age, of apparently healthy constitution, while splitting wood with an axe, cut through the index finger of his left hand, between the first and second phalanges. He lifted the separated parts from among the shavings, and immediately walked a few yards to a place where I happened to be. Being asked for the amputated portion, he took it from his waistcoat pocket and laid it on the table. I fixed it on by two sutures, and adhesive strap, and on the fourth or fifth day, a pair of scissors being applied to the point of the finger, he distinctly felt them. Complete union took place, with restoration of the powers of the part which had been separated."

We have here an apparently *clean-cut narration*, the least equivocal we can find on record, and enough, one would think, if without error, to settle the *possibility* of reunion after complete separation of parts. But we find a more remarkable case reported by Signor della Fanteria.⁷

"A girl, fourteen years old, was engaged with another person in some domestic occupation, when the latter accidentally let fall a knife which cut off two of her fingers below the first phalanx. The author being soon

⁵ *Edinburgh Med. and Surg. Journal*, Oct., 1815, Vol. X., p. 425.

⁶ *Edinburgh Monthly Journal of Medical Science*, April, 1841, p. 257.

⁷ *British and Foreign Med. Review*, July, 1842, p. 231.

after summoned found the two pieces in some meal on which the patient's hand was resting at the time of the accident ; but he discovered, to his great surprise, that each of them was divided into two portions. Having put the bits together, he kept them all in their places with sutures and strips of plaster. In a few days the adhesion was completed, and the patient ultimately recovered the entire use of her fingers." This "strange case," as it is called by the *British Review*, is vouched for by Profs. Centofanti and Vacca; and "might be doubted," says Braithwaite, "by the English reader, had it not a corroboration in the case related by Graham," as cited above.

Braithwaite reprints the following by Mr. Denny.⁸ "A laboring man applied to me to dress the thumb and forefinger of the left hand. Upon examination I found he had, by a clean incision, cut out of the thumb a triangular-shaped piece, the incision extending from the end down the center of the nail, nearly to the root, then outward towards the forefinger. The piece thus disunited consisted of the portion of nail described, integument, muscle, and a minute portion of bone. I sent him back to the distance of two miles, to search for the dismembered portions, which I carefully washed with warm water, and adjusted in exact apposition to the surfaces from whence they were cut. I freely applied collodion, so as effectually to exclude the atmosphere, and with pieces of strapping, held them in position. The result has been perfect reunion of both pieces, leaving little or no cicatrix. The period that elapsed from the occurrence of the accident to the replacing of the parts was four hours. The pain, which was very acute, from the exposure of the cut surfaces to the atmosphere, ceased immediately that the parts were replaced."

The statement "little or no cicatrix" in the forgoing, seems rather unfortunate for full confidence in the exactness of the rest of the report.

We quote the following for *the rule*, which it speaks of as an acknowledged general rule. The patient was a lad fifteen years old. Dr. V. Stone,⁹ who reports the case, says: "I found the thumb cut, or rather crushed through, at the metacarpo-phalangeal joint, and hanging quite loose, a piece of integument half an inch broad alone keeping it from being completely separated from the hand. Of course the first thing thought of, and probably, *according to all rule, the proper thing to do*, (the italics are our own) was to amputate." This was as late as 1869. He did not amputate, however, but carefully secured the parts in natural position, and applied appropriate dressings. He says, furthermore, that the healing rapidly progressed, and that in two months' time the boy had

⁸ Braithwaite, Vol. XX., art. 65, 1850—From *London Lancet*, Sept. 8, 1849, p. 205.

⁹ Braithwaite, Vol. LX., art. 44, 1870—From *Medical Times and Gazette*, Aug. 14, 1869, p. 189.

a very useful hand, capable of grasping tolerably well, though the thumb was quite stiff at the joint.

Edward Daniell¹⁰ reports several cases in point, but the descriptions are too meager to rely upon to any great extent.

The editor of the *Medical Times and Gazette*¹¹ affirms that the author of a non-medical book under review has "committed a perilous indiscretion" in contending that, "when once a member of the body is cut off and continuity completely destroyed, reunion is out of the question"; and somewhat emphatically declares, "that parts of the body may be clean cut off, and yet vital union be perfectly effected, was, we thought, an accepted fact." In support whereof the editor refers to Bailey's case (cited above) to the transplantation of teeth, and the engrafting in every hospital of "little snicks of skin."

A correspondent in the next number of the *Gazette*¹² rather impatiently thus relieves himself: "I thought that every one who had got a medical education was aware of the fact that certain parts of the human body, when completely severed therefrom, could be again made to unite. One of the first lessons I learned when a medical student was that fingers and toes were not to be needlessly sacrificed when clean cut off, but were to be replaced for the purpose of again uniting." He then gives two cases. In the one case a "finger-point," probably a "little snick," was clean cut off, "but in about six weeks' time union was effected." In the other case the patient "severed his great toe clean across—leaving the member hanging by a piece of skin."

Probably in the first case the point decayed and came off in the dressing, and the wound became partially filled up by granulations. We have known of such, deceiving even the attending surgeon. The second case, having connecting skin, needs no comment except as an example of loose language—"clean across," but "hanging by a piece of skin!" A lens or a microscope, in examining the cicatrix, might aid in clearing up doubt in such cases.

The same correspondent goes on to say, that "the personal experience (*sic*) of great surgeons such as Ferguson and Erichsen does not, we imagine, condescend to teach what the most unlearned medical tyro must certainly be made aware of by clinical teachers."

Now at the risk of committing "a perilous indiscretion," we are willing to confess that, while having been made aware, by clinical teachers, of the prevalent dogmas in regard to the subject under revision,

¹⁰ *Brit. Med. Journal*, Jan. 11, 1862, p. 37.

¹¹ *Medical Times and Gazette*, July 20, 1872, p. 80.

¹² *Medical Times and Gazette*, July 27, 1872, p. 112.

we have been greatly surprised at the fewness of facts on which these dogmas rest. After diligent search we have found, in the literature of the profession, only two or three cases on which any reliance can be placed in determining the question of the possibility even, of the vital reunion of parts that have been unquestionably completely severed.

It is quite possible that the small number on record may be because of the opinion—"the practice is to amputate;" or that some think the attempt at such reunion not worth while; possibly others do not give their experience. Such is the looseness of language, as we have shown, in most of the cases which have been reported, that even those which might have been beyond suspicion unavoidably receive less confidence, through the fear that, after all, some error, of which the narrator was unconscious, may have crept in. Why did Druitt change his reference in this matter if he continued to feel the same confidence in his original case that he had when first cited? The doctrine which we, in common with the editor of the *Times and Gazette* and others, but recently considered as an accepted fact, we find, on investigation, much to our disappointment, resting upon very insufficient evidence, and that, too, of a very unsatisfactory character.

Thus much for periodicals, so far as we have been able to examine them. As for the standard works, so-called, and text-books,¹³ many evade or omit the subject altogether; possibly because, as we have been told, their "experience does not condescend" to treat of such matters.

Zeis¹⁴ gives several instances of reunion after complete disconnection of parts. We have not been able to examine, in all these, the original reports, but the evidence does not seem to be more exact than in the cases above referred to.

Velpeau¹⁵ refers to several instances of alleged complete separation followed by reunion, and then says: "I, myself, hesitated to admit of their accuracy until an observation, absolutely conclusive, succeeded, in 1837, in removing all my doubts." But this observation referred to "the pulp of the left forefinger," which was "cut off" by a razor, and reapplied at once. He remarks, further, "in admitting that most of the facts related until now are doubtful, or that they have been imperfectly detailed, it is certain that some of them have a real existence." "I do not, therefore," he continues, "see how we can possibly call in doubt, at the present time, the practicability of uniting, by anaplasty, tissues that

¹³ The author has not been able to find anything on the subject in Bryant, Ashhurst, Ferguson, Gant, Gross, Paget, Agnew, Gamgee and Pilcher.

¹⁴ Handbuch der Plastischen Chirurgie. Berlin. 1838, p. 31.

¹⁵ Velpeau's Surgery, by Mott, 1847, Vol. I., pp. 589—593.

have been completely separated from the body. In place of rejecting this class of observations, surgeons consequently will in future examine into them, and reserve a place for them in practice." Nevertheless, more recent authorities are not so positive, even in opinion, to say nothing of fact.

Erichsen¹⁶, notwithstanding what was said of him by the correspondent of the *Times and Gazette*, besides other counsel, thus discourses: "There are even cases on record in which parts that have been completely separated have become attached by being immediately reapplied to the surface from which they had been torn. Whether this be actually the case or not, it is at all events certain that a very small tongue of skin is sufficient to maintain the vitality of a part." Observe the doubt in "whether or not," and, that he evidently does not expect reunion unless the parts are connected, though it be merely, as he repeats, "by a narrow bridge of skin."

Annandale¹⁷ says: "There are several curious examples on record in which portions of fingers or toes, that have been entirely severed from the body, have become reunited on being carefully readjusted in their former position." "On record" again: not seen or vouched for by himself.

In Holmes' *Surgery*,¹⁸ however, it is stated that Hoffacher "mentions some remarkable instances, which are attested by Chelius and Velpeau, of the reunion of parts completely sliced off by sword cuts, *e.g.*, portions of the nose, lips or chin." But this *caut* is added: "No such license can be allowed in plastic surgery: the flap must retain its connection to the adjacent living structure by a pedicle, which is to be severed only after complete union and cicatrization of the raw surfaces." Possibly the portions said to be sliced off were not wholly disconnected from the face.

Druitt,¹⁹ whose work has been in every tyro's hands for the last forty years, was a compiler only, not a practitioner of surgery, who gives no opinion of his own,—having cited a case, as we have seen, only in confirmation of his advice to make attempts for reunion in every instance.

Billroth,²⁰ one of the highest of modern authorities, and of amplest experience, candidly says that he has "never had the opportunity of making observations on such cases [*i.e.* of reunion after complete separation]: still, in quite recent times, very trustworthy men have reported that they have seen small portions....again unite." "Formerly," he continues, "on *a priori* grounds, I contended against the possibility of such healing, but must now admit it for theoretical reasons, the move-

¹⁶ *The Science and Art of Surgery*, Am. Ed. 1859, p. 118—or Ed. 1864.

¹⁷ Annandale—*Malformations of the Fingers and Toes*, 1866, p. 194.

¹⁸ Holmes' *System of Surgery*, Am. Ed., 1882, Vol. III., p. 620.

¹⁹ Druitt's *Surgeon's Vade-Mecum*.

²⁰ *Surgical Pathology and Therapeutics*, New Syd. Soc. Ed., 1877, Vol. I., pp. 92-93.

ments of the cells permitting us to suppose that the detached portion, if not too great, may very soon be restored to life by the entrance of wandering cells."²¹ He says further "Rosenberger²² has brought this account (of Zeis, who is said to have collected all cases in medical literature) down to most recent times, and communicates a number of cases carefully observed by him in which portions of the nose and fingers which had been chopped off, again united after being carefully joined together." We have not been able to find Rosenberger in our medical libraries.

We have heard it said that one must sometimes believe on testimony what he would not believe on sight, lest his eyes deceive him, and on such grounds we may accept with Billroth, the accounts of "wonderful cases," as he calls them; but if "wandering cells" can penetrate and revive portions of flesh that, after complete disunion for hours, have become white and cold, or look and feel like a bit of candle, it will not be a work of supererogation for the profession to go over the whole matter, and, with greater accuracy than now obtains (as far as our research has gone), determine the limits of reparative or conservative surgery in the restoration of parts that have been wholly severed from the body.

In consequence of the unsatisfactory character of the few publications on the subject, this paper is offered, in the hope of eliciting further information, or of bringing out the views of members of this Society and of others who may be interested therein.

²¹ Billroth seems to rely upon Theirsch for his "theoretical reasons," while Rindfleisch, in a rather circular way, cites Billroth in confirmation of Theirsch. Rindfleisch says of Theirsch, [Path. Histology, New Syd. Soc. Ed. Vol. I., pp. 116-117] that "should his interpretation of them [migrating corpuscles] be confirmed, they will materially extend our ideas respecting the development of new vessels in general." He, further on, says that, in accordance with this view, Theirsch proceeds "to explain a fact which is certainly very enigmatical, *viz.*, that even parts which have been completely separated from the parent organism may reunite with it, provided they are stitched on early enough." Here we have an "enigmatical fact," explained by "theoretical reasons." What we now want is not an enigma, but *fact*; its explanation may come, or not, hereafter.

Boston Med. and Surg. Journal, Dec. 27, 1883, p. 619, first col.—Stricker, Spiena of Prague, Charles Heitzman of New York, say, "that the time has now come when the old 'cell doctrine' must be given up." If this be true, what becomes of Billroth's "theoretical reasons?"

²² Billroth's Surgery, Vol. I., p. 93, New Syd. Soc.



